



**UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office**

Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

T.D

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/038,230	03/11/98	KOYANAGI	1217-980347

IM22/1129

RUSSELL D ORKIN
700 KOPPERS BUILDING
436 SEVENTH AVENUE
PITTSBURGH PA 15219-1818

EXAMINER
METZMAIER, D

ART UNIT	PAPER NUMBER
1712	<i>16</i>

DATE MAILED: 11/29/00

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.
09/038,230

Applicant(s)
Koyanagi et al.

Examiner
Daniel S. Metzmaier

Group Art Unit
1712



☒ Responsive to communication(s) filed on Sep 15, 2000

☒ This action is **FINAL**.

☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire three month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claims

☒ Claim(s) 1 is/are pending in the application.

Of the above, claim(s) _____ is/are withdrawn from consideration.

☐ Claim(s) _____ is/are allowed.

☒ Claim(s) 1 is/are rejected.

☐ Claim(s) _____ is/are objected to.

☐ Claims _____ are subject to restriction or election requirement.

Application Papers

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some* ☐ None of the CERTIFIED copies of the priority documents have been
☐ received.

☐ received in Application No. (Series Code/Serial Number) _____.

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

☐ Notice of References Cited, PTO-892

☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). _____

☐ Interview Summary, PTO-413

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

Art Unit: 1712

DETAILED ACTION

Claim 1 is pending in the instant application. This action is responsive to the response filed September 15, 2000, Paper No. 15.

Response to Amendment

1. The cross-noting amendment to the specification after the title should be deleted as redundant. See 37 C.F.R. 1.78(2) and M.P.E.P. § 202.01, Seventh Edition, Revision 1, Feb. 2000.

Claims interpretation

2. Applicant's claim is directed to inorganic oxide sols comprising a modified composite oxide particulates. Said sols have a dielectric constant of 10 to 85, a particle size range of 11 to 30 nanometers, and a specific classes of organosilane compounds. Said compounds are further limited to exhibiting a molecular polarizability of 2×10^{-40} to $850 \times 10^{-40} \text{ C}^2 \text{ m}^2 \text{ J}^{-1}$.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371© of this title before the invention thereof by the applicant for patent.

Art Unit: 1712

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103© and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

5. Claim 1 is rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Kato et al., US 5,322,888. Kato et al (example 7) discloses composite sols of Optolake 1130F-2 which is a $\text{SiO}_2/\text{TiO}_2/\text{Fe}_2\text{O}_3$ composite having a particle size of 20 nm in methanol. Said coating composition is surface modified with γ -glycidoxypropyltriethoxysilane. The dielectric constant for methanol at 20°C is 31.2.

The claimed molecular polarizability would have been inherent to the reference exemplified γ -glycidoxypropyltriethoxysilane based on the close structural similarity to the

Art Unit: 1712

instantly disclosed γ -glycidoxypropyltrimethoxysilane and γ -glycidoxypropylmethoxydiethoxysilane. See instant page 7, lines 1 et seq; particularly lines 17-18 which teach the related silanes as examples of compounds having the claimed molecular polarizability.

To the extent the claim differs in the silane surface modifier having the claimed molecular polarizability, compositions employing the instantly disclosed compounds having the molecular polarizability would have been obvious to one of ordinary skilled in the art at the time of applicants invention for the following reasons.

Kato et al (column 2, lines 35 et seq; particularly lines 68-69) teaches γ -glycidoxypropyltriethoxysilane and γ -glycidoxypropyltrimethoxysilane among other treating agents and makes no distinction therein. It would have been obvious to one of ordinary skilled in the art at the time of applicants invention to employ the γ -glycidoxypropyltrimethoxysilane for the γ -glycidoxypropyltriethoxysilane exemplified in the Kato et al reference as an obvious functional equivalent taught therein.

6. Claim 1 is rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Kayanoki, US 5,858,077. Kayanoki '077 (examples and claims) discloses compositions comprising a composite metal oxide dispersed in methanol and/or isopropanol with the further addition of a polymerizing monomer. Kayanoki '077 (column 4, lines

Art Unit: 1712

46-53 and claims) teaches composite particle sol compositions (Optolake 1130 F-2 (A-8)¹) wherein the particles have a particle size of 10 nm and broadly may be 1 to 100 nm. Kayanoki '077 (example 1) teaches treating the methanol dispersed composite particle sol with γ -glycidoxypropyltrimethoxysilane followed by the addition of isopropanol and a polymerization monomer.

The claimed dielectric constant property of the dispersion medium would have been expected to have been inherent to the dispersion medium disclosed in the Kayanoki '077 reference because methanol has a dielectric constant at 20°C of 31.2, isopropanol has a dielectric constant at 20°C of 18.62, and propanol is instantly disclosed as (see instant page 8, line 23) a suitable organic solvent useful in the instant application. The γ -glycidoxypropyltrimethoxysilane is specifically disclosed (see instant page 7, lines 16-17) as useful in the instant application having the instantly disclosed and claimed molecular dispersibility.

To the extent the claim differs in the further addition of the polymerization monomer, there is no evidence of record to support this conclusion. Furthermore and assuming *arguendo* any material effect were present to the dielectric constant due to the further addition of the polymerization monomer, the instant invention (see instant page 1, lines 5-15, particularly lines 7-8) and the Kayanoki '077 (column 1, lines 10 et seq) both teach coating compositions including hard coat coating agents. It would have been obvious to one of ordinary skilled in the art at the

¹Applicant should compare the instant commercial product and those disclosed in the Kato et al reference which are characterized as coated particulate sols.

Art Unit: 1712

time of applicants invention to employ the intermediate sol as an intermediate for use in several different coating systems such as those shown by Kayanoki '077 (example 1 and examples 18-24).

It is further noted, Kayanoki '077 (column 4, lines 33-46) broadly teaches the use of numerous solvent systems including ethylene glycol and Kayanoki '077 (column 3, line 24 to column 4, line 18) broadly teaches numerous silane modifying agents including the classes of silanes claimed.

7. Kayanoki, 5,654,090, is considered cumulative to the above rejections. Attention is directed to the examples.

Response to Arguments

8. Applicant's arguments filed September 15, 2000 have been fully considered but they are not persuasive.

9. Applicants (pages 5-8) arguments regarding Kato et al have not been deemed persuasive. Applicant (pages 5-8) argues the instant claims are distinguished over Kato et al for the following reasons: (1)² Kato et al discloses titanium oxide-based composite particles wherein titanium oxide is combined integrally with iron rather than the claimed SiO₂ composite particles, (2) Kato et al teaches a hydrolyzate of a silane compound as a matrix forming coating component rather than SiO₂ composite particles modified with specified types of silanes having a specified molecular polarizability, and (3) the teachings of Kato et al (column 3, lines 26-44) is not a teaching of the selective use of silanes as claimed.

²Each of applicants' arguments are addressed in turn and in the paragraphs to follow as they are presented.

Art Unit: 1712

Regarding item (1): initially, applicants claim requires as the composite element a specified particle size, composite oxide particulates composed of silica (SiO_2) and at least one inorganic oxide other than silica. Kato et al (column 1, line 40 to column 2, line 27) discloses coating compositions comprising components (A) hydrolyzate of a silane compound, (B) titanium oxide-based composite, (C) polycarboxylic acid or anhydride, and (D) heat-curing catalyst³. Kato et al (column 2, line 34 to column 3, line 68) teaches component (A). Kato et al (column 4, line 1 to column 5, line 43) discloses component (B). Kato et al (column 4, lines 6-9 and 24-28) discloses the silicon oxide is intimately combined with the titanium oxide as the titanium oxide-based composite component. Kato et al further (column 5, lines 27-44) discloses the composite particles are preferably surface treated with a silane coupling agent including γ -glycidoxypropyltriethoxysilane and γ -glycidoxypropyltripropoxysilane.

Kato et al (column 8, line 62 to column 9, line 4) characterizes the hydrolyzate as HG-40. Kato et al (examples, preparation of coating composition; particularly example 4(a) and 7(a)) discloses composites having 10 parts SiO_2 and surface modified with vinyltriethoxysilane and γ -glycidoxypropyltriethoxysilane.

Kato et al clearly discloses and or contemplates composite oxide particulates composed of silica (SiO_2) and at least one inorganic oxide other than silica as pointed out by the specific citations.

³Further reference to component (C) and (D) of Kato et al is not made hereafter since the instant claim neither requires nor excludes said components of patentee. Acids are instantly disclosed (page 9, lines 5-14) as usable in the instant claimed invention.

Art Unit: 1712

10. Regarding item (2): the examiner is unable to test the particular molecular polarizability of the claimed surface modifiers. The specific surface modifier referred to at Kato et al, column 9, line 55, is disclosed at page 7, line 9 of the instant specification as an example of an organic compound molecular polarizability of 2×10^{-40} to $850 \times 10^{-40} \text{ C}^2 \text{ m}^2 \text{ J}^{-1}$. Similarly, the Kato et al modifier at column 10, lines 18-20, is disclosed at page 7, line 17-18 of the instant specification. Attention is directed to M.P.E.P. § 2112 and 2141.02, Seventh Edition, Revision 1, Feb. 2000.

Applicants' interpretation of the coupling agent as the hydrolyzate is in error. Therefore, said argument has not been deemed persuasive.

Regarding item (3): Kato et al exemplifies surface modifiers which read on modifiers instantly disclosed as having the claimed property of molecular polarizability. Applicants comparative results in the specification example are not applicable to the anticipation of the claimed compositions. To the extent the claims are not anticipated, the exemplified modifiers and compositions are so structurally similar to those claimed that the ordinary skilled artisan would have been motivated to make related compositions disclosed and contemplated in the Kato et al reference.

11. Applicants (page 9) assert Kayanoki '090 employs epoxy group-containing compounds as part of the matrix forming compositions rather than a particulate modifier claimed. Applicants further assert the amount of the modifier is much larger than the amount employed in the instant invention. Applicants assertions have not been deemed persuasive since Kayanoki '077 (column 3, lines 19 et seq; particularly 19-23) and Kayanoki '090 (column 3, lines 16 et seq; particularly

Art Unit: 1712

16-20)⁴ teach composite oxide may be subjected to surface modification with organosilicon compounds. Kayanoki '077 (lines 24 et seq) teach the organosilicon compounds including those set forth on page 7 of the instant specification.

Applicants' assertion regarding concentration of the organosilicon compounds is not commensurate with the claim since the claim does not recite any concentrations and/or ratios. Therefore, said argument has not deemed persuasive. Furthermore, an excess of the surface modifying agent would have been expected to surface modify the composite particulates of Kayanoki.

12. Applicants (page 9) assert the Kayanoki references do not teach the selective use of specific organosilicon compounds claimed. This has not been deemed persuasive due to the substantial overlap of the compounds disclosed in the Kayanoki references and the those disclose at the instant page 7.

13. Applicants merely conclude the selective use of the claimed compounds is not disclosed but fail to provide a basis for said conclusion. Applicants do not address the substantial overlap of compounds at instant page 7 and Kayanoki '077, column 3, line 24 to column 4, line 18. Furthermore, the notion of a compound and its properties are inseparable is well known. Please see **In re Papesch**, 315 F.2d 381, 137 USPQ 43 (CCPA 1963).

⁴Kayanoki '077 is a divisional of Kayanoki '090 for purposes of prior art are deemed to be the same or substantially the same. Only Kayanoki '077 will be referred hereafter.

Art Unit: 1712

14. Applicants conclusionary remarks on page 10 of the response have been addressed herein above.

Conclusion

15. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel Metzmaier whose telephone number is (703) 308-0451. The examiner can normally be reached on Monday through Friday from nine to five-thirty.

Art Unit: 1712

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Dawson, can be reached at (703)308-2340.

Official Papers may be submitted to **Group 1700** by facsimile transmission at (703) 872-9310 and Official After Final facsimile transmissions may be submitted to **Group 1700** by facsimile transmission at (703)872-9311 in accordance with the notice published in the Official Gazette, 1096 OG 30 (November 15, 1989).

Any inquiry of a general nature or relating to the status of this application should be directed to the **Group 1700** receptionist whose telephone number is (703) 308-0661.

DSM
November 27, 2000

Richard D. Lovering
RICHARD D. LOVERING
PRIMARY EXAMINER
GROUP ~~1200~~ 1700